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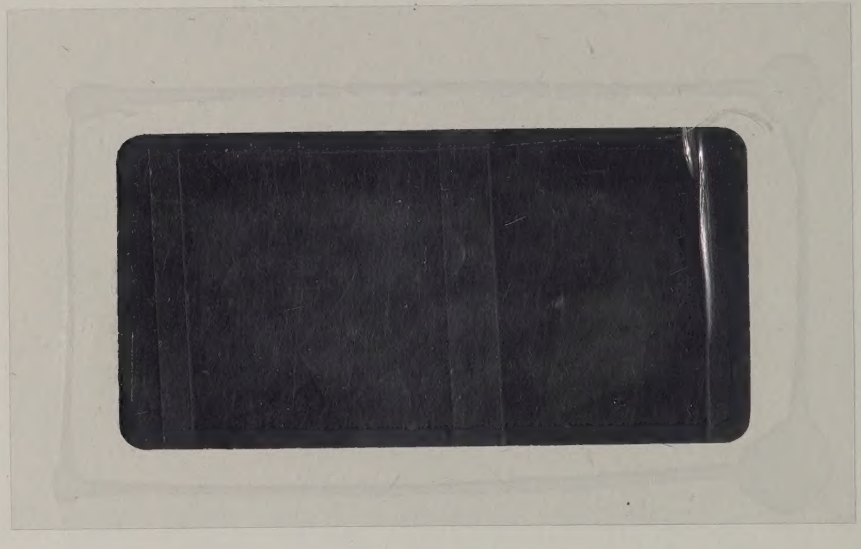

OPERATION MANUAL

TTL INTERFACE UNIT

MD0606A

ANRITSU CORPORATION

CERTIFICATION

ANRITSU CORPORATION certifies that this instrument has been thoroughly tested and inspected, and found to meet published specifications prior to shipping.
Anritsu further certifies that its calibration measurements are based on the Japanese Electrotechnical Laboratory and Radio Research Laboratory standards.

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All parts of this product are warranted by Anritsu Corporation of Japan against defects in material or workmanship for a period of one year from the date of delivery. In the event of a defect occurring during the warranty period, Anritsu Corporation will repair or replace this product within a reasonable period of time after notification, free-of-charge, provided that: it is returned to Anritsu; has not been misused; has not been damaged by an act of God; and that the user has followed the instructions in the operation manual.

Any unauthorized modification, repair, or attempt to repair, will render this warranty void.

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Note :

WARNINGs, CAUTIONs, Notes, and Explanatory footnotes are used in this manual. Their meanings are given below:

WARNING: WARNING is used when there is a personal injury hazard.

CAUTION: CAUTION is used when the equipment may be damaged.

Note: Note is used to provide information about exceptions, corrections, and restrictions.

Explanatory footnote:
Explanatory footnotes provide comments on the same page as the text, figure or table. They are referenced by either an asteirsk (*) or by combination of an asterisk and numeral.

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SECTION 1

GENERAL

1.1 Product Outline

The MD0606A TTL Interface Unit is inserted into the MD6401A Data Transmission Analyzer and is used to conduct measurements via the TTL interface.

The main functions are listed below:

1. Uses a TTL interface
2. Start/stop synchronous, asynchronous, ST1 (DTE is clock source), ST2 (DCE supplies clock), and RT (receive timing from the DCE is used as the send timing signal) timing modes
3. Send/Receive speed is 50 bit/s to 10 Mbit/s
4. Bit error and parity error measurement
5. Phase-difference time measurement between any two measurement signals.
6. Delay time measurement
7. Clock-line frequency measurement
8. Pulse counting function
9. Word-pattern generation and pattern tracing
10. Externally controllable (GP-IB and RS-232C)

Note:

DCE: Data Circuit-terminating Equipment

DTE: Data Terminal Equipment

1.2 Composition

1.2.1 Standard composition

Table 1-1 lists the standard composition of the MD0606A.

Table 1-1 Standard Composition

Item	No.	Name	Qty.	Remarks
Instruments	1	MD0606A TTL Interface Unit	1	Inserted into the MD6401A
Accessory supplied	2	Operation manual	1	W0140AE

1.3 Optional Accessories and Peripheral Equipment

Table 1-2 lists the optional accessories and Table 1-3 lists the MD6401A peripheral units that can be used to expand the MD0606A functions.

Table 1-2 Optional Accessories

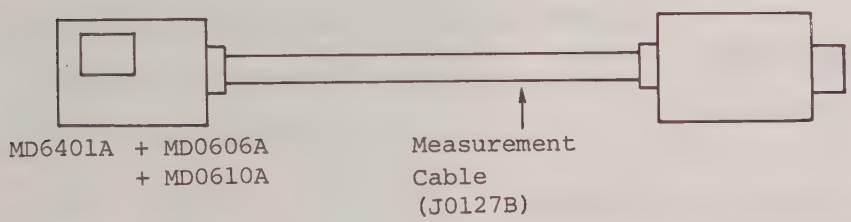
Model/Order No.	Name	Remarks
J0127B	Coaxial cable	BNC-P·RG-58A/U·BNC-P
J0386	External input probe	With BNC-P·IC clip

Table 1-3 Peripheral Units

Name		Remarks
MD0607A	Analog Interface Unit	Generates sine-wave signal, level meter, measures frequency of sine-wave signal
MD0610A	Distortion Unit	Measures single-point, bias, and start-stop distortions

1.4 Selection Guide for the MD0606A Unit

(1) Error and distortion measurement of device with TTL interface



1.5 Specifications

When combined with the MD6401A Data Transmission Analyzer, the MD0601A Interface unit conforms to the following specifications:

1.5.1 Operating conditions

Temperature: 0° to 50°C (storage -40° to 80°C)

Humidity: 65% ±20% (storage 20% to 95%)

Power supply voltage: 85 to 132/170 to 250 Vac (internally switchable in MD6401A, 250 Vac max), 47 to 63 Hz

1.5.2 Input/Output level

TTL level

1.5.3 Synchronizing methods

(1) Start-stop (ST/SP)

(a) Send rates

Internal: 50 bit/s to 20 kbit/s (Variable, 5 bit/s steps)

External: 50 Hz to 20 kHz (TTL or 0 ±1 dBm 75 Ω)

(b) Receive rates

External: 50, 75, 100, 110, 150, 200, 256, 300, 400, 500, 600, 768, 800, 1000, 1200, 1600, 1800, 2000, 2400, 3000, 3600, 4800, 7200, 9600, 14.4 k, 19.2 kbit/s

(2) Asynchronous (ASYNC)

Same as start-stop in paragraph 1.5.3 (1) above.

(3) Synchronous

(a) ST1 rates

Internal: 50 bit/s to 20 kbit/s (5 bit/s steps)
20 kbit/s to 400 kbit/s (100 bit/s steps)
512 kbit/s, 1024 kbit/s, 2048 kbit/s
4096 kbit/s, 8192 kbit/s

External: 50 bit/s to 10 Mbit/s (TTL or 0 ±1 dBm 75 Ω)

(b) ST2 rates

External: 50 bit/s to 9 Mbit/s

1.5.4 Start-stop synchronization parameters

STOP bit length: 1, 1.5, and 2

START bit length: 1

Data length: 5, 6, 7, and 8

Parity: None, odd, and even

1.5.5 Signal generation function

(1) Send pattern

(a) A, Z, 1:1, 3:1, 1:3, 7:1, 1:7, 4:1, 1:4

(b) Programmable pattern (8 bits repetitive)

(c) Pseudorandom pattern (reversible polarity, 2^n-1 bits repetitive, n: 6, 7. 9. 11. 15. 19, 20, or 23)

(d) Word pattern (8 bits x 8 k words, manual or remote setting, battery power backup can be selected)

(e) Memory pattern (8 bits x 8 k words, user installed ROM pattern is sent, only when the MD0610D is used)

(f) FOX pattern

(2) Error generating functions

Manual errors ... An error is manually generated each time ERROR insertion key is pressed. An error can also be generated once every second.

Cyclic errors ... Errors may be automatically generated at one of the following rates:

2.5×10^{-1} to 1.7×10^{-7} ($N \times 10^{-n}$,
N: 1.0, 1.1, 1.3, 1.5, 1.7, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0)

1.5.6 Error measurements

(1) Measurement patterns

(a) A, Z, 1:1, 3:1, 1:3, 7:1, 1:7, 4:1, 1:4

Note:

Error measurement is impossible on 1:4 and 4:1 patterns when the ST/SP mode is used and the data length is 8-bits.

(b) Programmable pattern (8 bits repetitive)

(c) Pseudorandom pattern (reversible polarity, 2^n-1 bits repetitive, n: 6, 7, 9, 11, 15, 19, 20, 23)

(2) Measurement error

(a) Number of bit errors (bit error)

(b) Error rate (error rate is measured and displayed every second, 1.0 to 1.0 x 10^{-20})

(c) Number of block errors (2^5 to 2^{16} or 10^1 to 10^6 bit blocks)

(d) Block error rate (measured and displayed every second, 1.0 to 1.0 x 10^{-20})

(e) ES (Measured and displayed every second)

(f) %ES (Measured and displayed every second)

(g) DM (Measured and displayed every minute)

(h) %DM (Measured and displayed every minute)

(i) SES (Measured and displayed every second)

(j) %SES (Measured and displayed every second)

(k) US (Measured and displayed every second)

(l) %US (Measured and displayed every second)

(3) Measured result display

1. Three arbitrary items from among the measurement errors listed in paragraph 1.5.6 above can be displayed simultaneously.

2. A buzzer signals the occurrence of each error. (Buzzer volume is adjustable.)

3. Elapsed time after start of measurement is continuously displayed in units of seconds.

(4) Measurement time

1. Measurements may be initiated or terminated manually with the [START/STOP] key.
2. Measurements may be terminated by specifying a certain number of bits. The range of this bit trigger is 10^2 to 10^9 bits.
3. The duration of a measurement may be specified by means of a clock which can be set from 10 secs to 999 hrs 59 mins 59 secs (41 days).
4. The period of a repetitive measurement may be specified to be 10 secs to 999 hrs 59 mins 59 secs (41 days).

1.5.7 Pattern trace function

A pattern of up to 32 kbytes can be traced and displayed in HEX, ASCII, EBCDIC, EBCDIK, or JIS8.

(1) Trace stop trigger

The MANUAL, CODE, NOT CODE, CONTROL LINE ON/OFF, the external input signal, or the number of trace bytes may be used as the trace stop control trigger.

(2) Delayed trace

A delayed trace may be initiated after trigger detection of 0 to 8000 bytes.

1.5.8 Distortion measurements (with MD0610A)

(1) Single point distortion

Displays maximum value with "A" side measurement.

Measurement range: -49% to +49% (1% steps)

Accuracy: ≦±1%

(2) Bias distortion

Measurement pattern: 1:1, 4:1, 1:4

Measurement range: -100% to +100% (1% steps)

Accuracy: ±3%

(3) Start-stop distortion (≦19.2 kb/s)

Displays maximum value.

Measurement range: -49% to +49% (1% steps)

Accuracy: ±1%

1.5.9 Frequency measurement and counting

(1) Measurement signal

SD, RD, ST1, ST2, RT, and the external input signal frequencies can be measured.

(2) Measurement range

The frequency measurement range is DC to 10 MHz.

(3) Measurement accuracy

Measurement accuracy is ±10 ppm ±1 digit (LSD).

(4) Display

Effective digits: 7 decimal digits are displayed. (Hz)

0 to 10,000.00 kHz (100 ms set)

0 to 1,000,000 Hz (1 sec set)

0 to 100,000.0 Hz (10 secs set)

0 to 1,000,000 (MANUAL set)

1.5.10 Time measurement

(1) Measurement signals

1. The time between signal transitions of any two signals from among the following set of signals (SD, RD, ST1, ST2, RT, and the external input signals) can be measured.
2. The SD send to RD receive delay time can be measured.

(2) Measurement range

0 to 10 secs (10 μs steps, 7 decimal digits are displayed)

1.5.11 Monitoring of signals

(1) Visual monitoring of signals

(a) The signal states of SD, RD, ST1, ST2, and RT can be visually monitored.

(b) RD is monitored in 8-bit units.

(c) Lighting conditions

Data	1:	Green
	0:	OFF
Timing	ON:	Green
	OFF:	OFF
Control line	ON:	Green
	OFF:	OFF

(2) External monitoring of signals

SD, RD, ST1, ST2, and RT are each sent to an assigned monitor terminal; therefore, these signals may be monitored externally if so desired.

1.5.12 Printing

(1) Printing at error measurement

(a) Printing at measurement start

When a measurement is started, the start time and the selected parameters for that measurement are printed out.

(b) Printing during measuremnt

If there are one or more errors within a 1-second period, then the measured results and the time of error are printed out.

A print out of the measured results and time can also be initiated manually.

The measured results and time are printed out at the end of the measurement period only if one or more errors has occurred within that time period.

(c) Printing at measurement stop

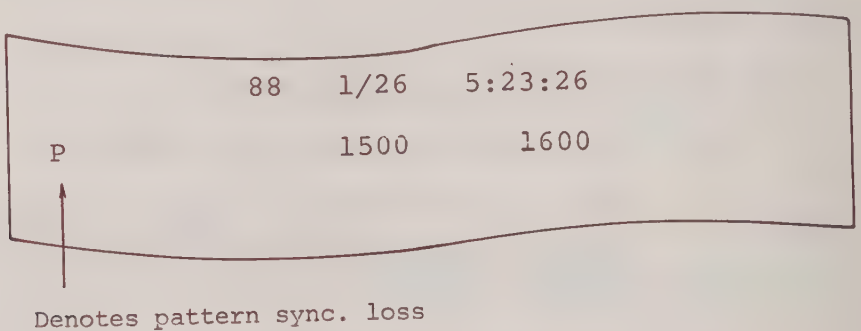
When a measurement is stopped, the measured result and time are printed out.

(d) Printing of alarm data

If pattern synchronization or the receive-clock signal is lost, data will be printed every second.

When pattern synchronization is lost, the alarm data are output even if the error counting mode has not been internally selected for the MD6401A.

Example:



I: Receive-clock input loss
R: Receive-clock input recovery or printer paper save function reset

Note:

Receive-clock input loss is printed twice: once at the generation time and once at the recovery time.

(e) Printer paper save function

If errors are generated for ten consecutive 1-second intervals and if the printer paper save function has been enabled, then printing is disabled but measurements continue. Afterwards, if no errors occur for ten continuous 1-second intervals, then the printer operation is automatically reset.

If the PRINT switch is set to OFF and then ON again while the printer is disabled, the printing-stop status is cleared and printing is enabled until the next stop condition occurs.

Note:

The printer paper save function is controlled via an internal ON/OFF switch inside the MD6401A.

(2) Printing screen information and measurement results

The information and measurement results on a single screen can be output manually by means of the [PRINT] key on the front panel of the MD6401A.

1.5.13 Dimensions, weight and power consumption

Dimensions:	145 H x 30 W x 230 D mm
Weight:	$\leqq$0.6 kg
Power Consumption:	$\leqq$4 VA

SECTION 2

PREPARATIONS

Even though the MD0606A is inspected before factory shipment, it should be visually inspected at the time of delivery.

Before unpacking, check that there is no external damage to the shipping container.

After unpacking, check the external appearance of the MD0606A, the MD0606A accessories, and the number of parts.

If any damage is found, contact ANRITSU immediately.

2.1 Environmental Specifications for the Installation Location

The MD0606A can operate at ambient temperatures from 0° to 50°C; however, avoid using it where:

1. there are severe vibrations
2. there is high humidity
3. there is dust or dirt
4. It will be exposed directly to sunlight.

In addition to meeting the above requirements, the life of the instrument will be prolonged if it used at room temperature.

2.2 Preparations for Power-On

1. The MD6401A can operate on either 85 to 132 Vac or 170 to 250 Vac (the power rating can be changed via an internal switch). Power frequency is constrained to a 47 to 63 Hz range.

Before power-on, check the power-supply voltage. Also, ground the frame ground terminal to prevent an accidental electric shock. Finally, turn the POWER switch of the MD6401A OFF before connecting the power cord.

2. Check that the plug-in unit is firmly inserted into the MD6401A.
   (Secure it with the screws at the top and bottom of the plug-in unit.)

3. Check that the power cord is connected to the power supply.

Note:

Do not insert or remove the plug-in unit while the power is ON.

If the unit is inserted or remove while the power is ON, turn the power supply OFF and then ON again.

SECTION 3

PANEL EXPLANATION

3.1 Panel Layout

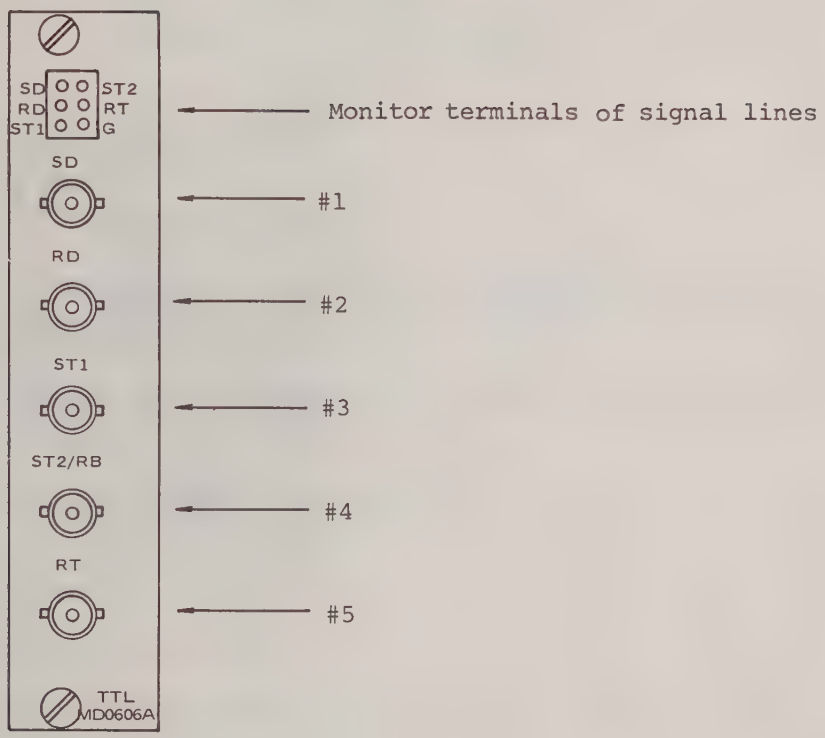


Fig. 3-1 MD0606A Front-Panel Layout

Number	Name	Explanation
#1	SD	Send data output connector
#2	RD	Receive data input connector
#3	ST1	Output connector for internal send clock
#4	ST2/RB	Input connector for external send clock, and for receive byte-sync signal.
#5	RT	External clock input connector for receive

Note:

The #4 input function is selected with an internal DIP switch. (See paragraph 3.2.)

3.2 Internal Switch Settings

Figure 3-2 shows the mounting diagram for the internal switches and terminals of the MD0606A.

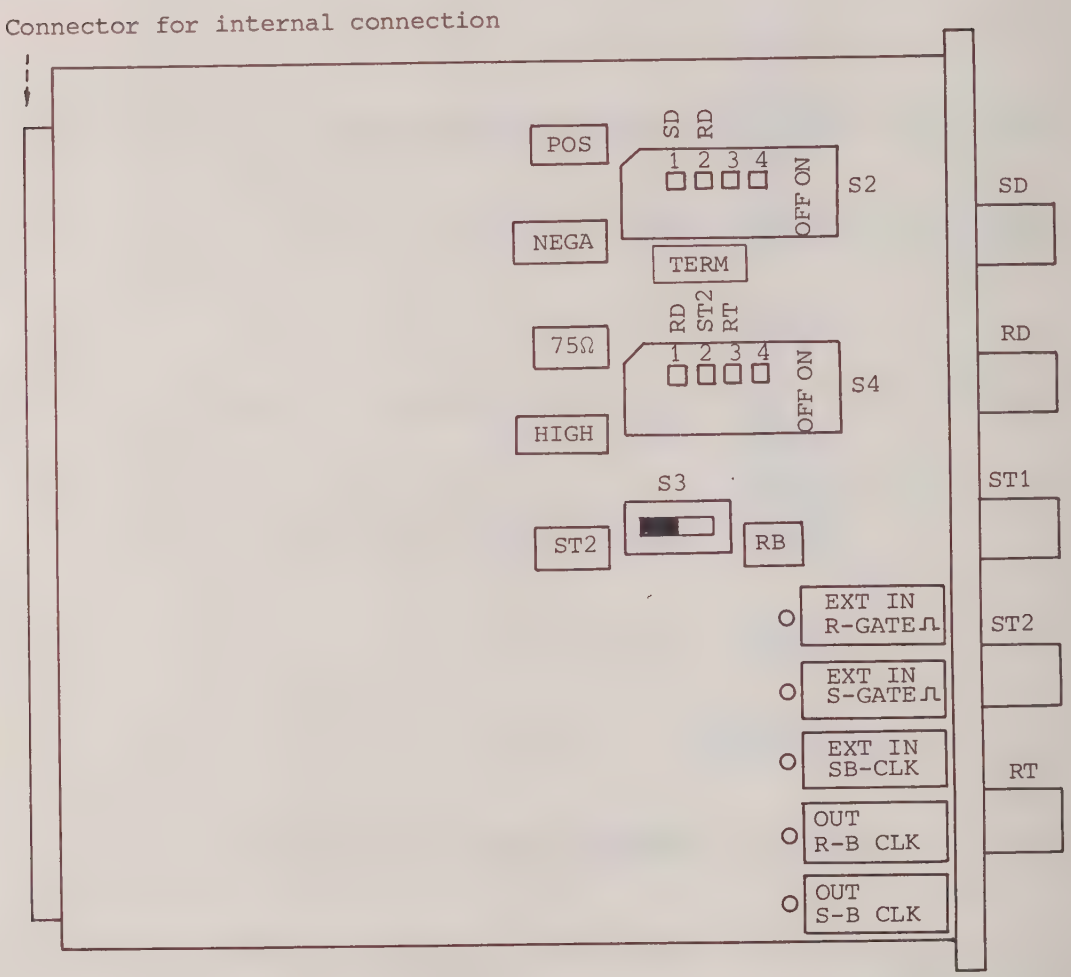
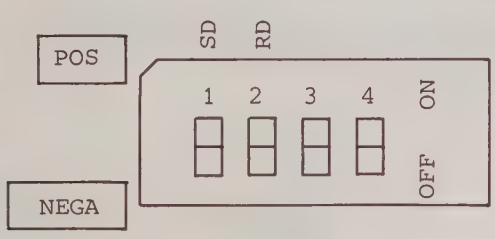


Fig. 3-2 Internal Switches and Terminals

3.2.1 Input/output signal polarity inversion

The input and output signal polarity can be inverted using S2 of Fig. 3-2.



SD: Selects the POS or NEG signal polarity for output from the SD connector of the MD0606A.

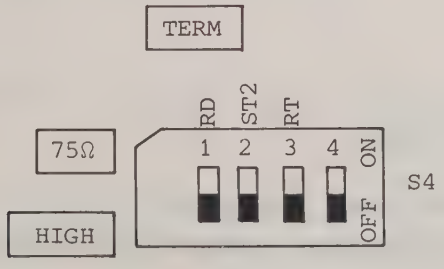
RD: Selects the POS or NEG signal polarity for input into the RD connector of the MD0606A.

POS: Does not invert signal polarity.

NEGA: Inverts signal polarity.

3.2.2 Input impedance setting

The input impedances for the RD, ST2, and RT input signals to the MD0606A may be set to HIGH or 75 Ω with DIP switch S4.

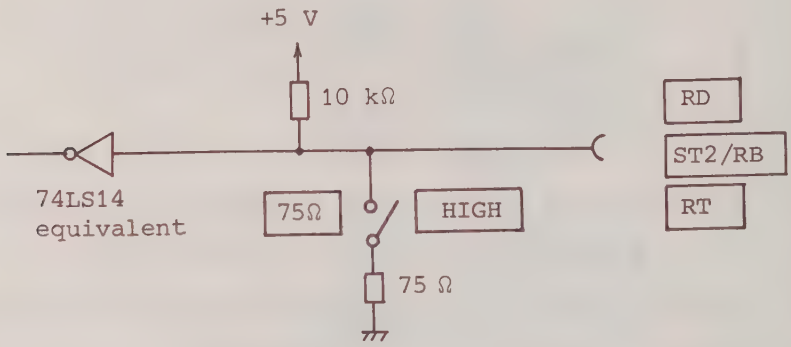


RD: Sets the input impedance for the RD connector to either HIGH or 75 Ω.

ST2: Sets the input impedance for the ST2/RB connector to either HIGH or 75 Ω.

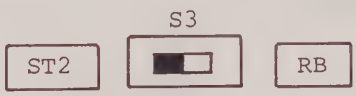
RT: Sets the input impedance for the RT connector to either HIGH or 75 Ω.

The input block diagram is shown below:



3.2.3 Selecting the ST2/RB connector input signal

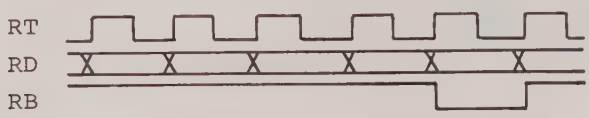
Either the ST2 (external send clock) or RB (receive byte-sync. signal) signal may be selected with the DIP switch S3.



ST2: Selected when the signal to the ST2/RB connector will be ST2.

RB: Selected when the signal to the ST2/RB connector will be receive byte-sync. signal.

RB can only be used when the send timing clock is ST1.

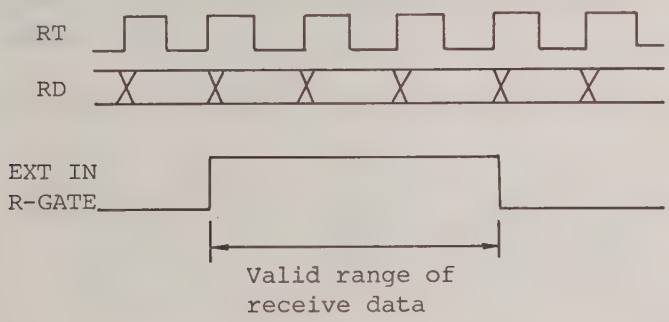


3.2.4 PC board signal check terminals

There are five signal check terminals on the PC board which can be used either to input external TTL-level signals or to output internal signals via the external input probe. (see Table 1-2).

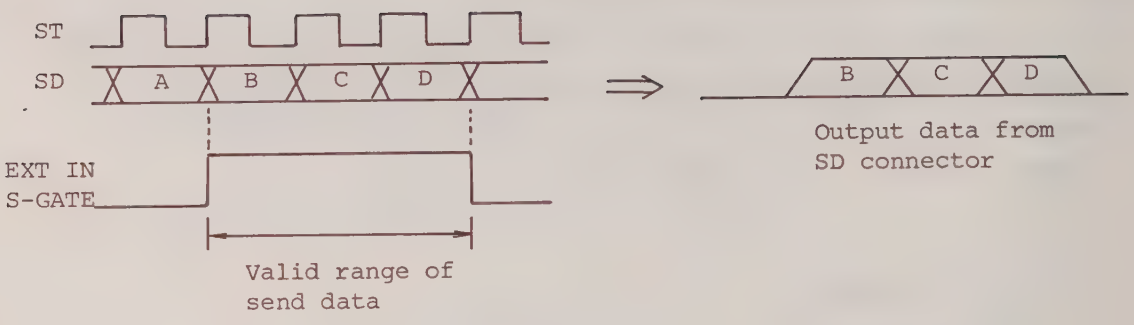
(1)

This signal check terminal is used to provide a gating signal for the receive signal. The receive signal is enabled when the gating signal from this signal check terminal is high and disabled when it is low.



(2)

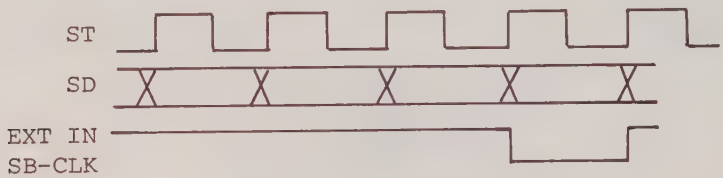
This signal check terminal is used to provide a gating signal for the send signal. The send signal is enabled when the gating signal from this signal check terminal is high and disabled when it is low.



③

EXT IN
SB-CLK

Input terminal for the send byte-sync. signal. This terminal can not be used if the send timing mode is ST/SP.



④

OUT
R-B CLK

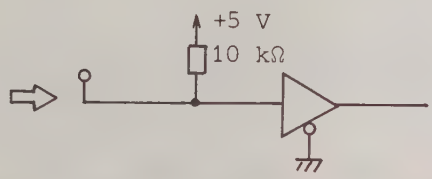
Outputs the RB CLK from the RB connector.

⑤

OUT S-B CLK

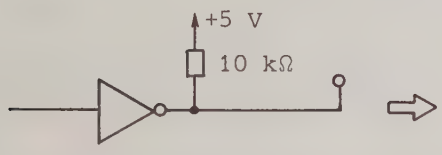
This signal check terminal outputs the send byte-sync. signal in ST/SP mode, or the input signal from the EXT IN SB-CLK terminal.

The input circuits for ①, ②, and ③ are shown below:



74LS125 equivalent

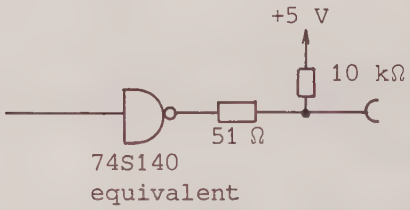
The output circuits for ④ and ⑤ are shown below:



74LS04 equivalent

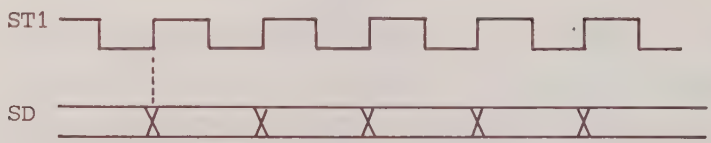
3.3 Output Circuit Diagram

The figure below shows the MD0606A output circuit.



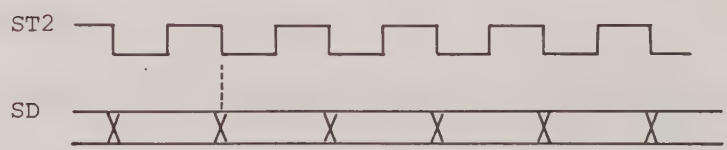
3.4 Send Timing

3.4.1 Send timing for ST1 mode

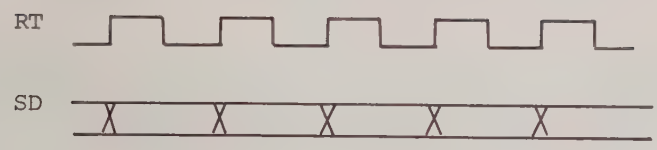


3.4.2 Send timing for ST2 mode

3.4.3 Send timing for $\overline{ST2}$ mode

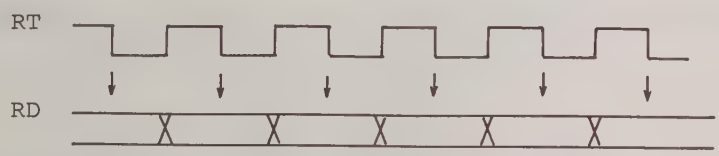


3.4.4 Send timing for RT mode



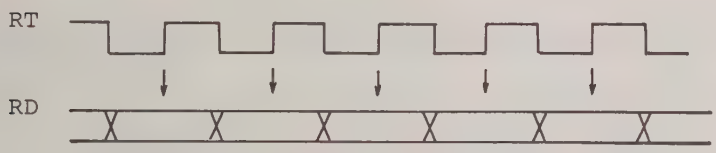
3.5 Receive Timing

3.5.1 Receive timing for RT mode



(The arrows indicate the timing for RD sampling.)

3.5.2 Receive timing for $\overline{RT}$ mode



(The arrows indicate the timing for RD sampling.)

SECTION 4

INTERFACE SCREEN MENU AND OPERATION CHECKS

The names of the interface screens which set the DUT-interface conditions and the names of the signals to be monitored are different for each MD06xxx unit.

This section shows the interface screen menu items and the sequence in which screens are presented. (A screen menu item may be selected simply by moving the cursor to the item that you want to select.) Finally, at the end of this section, a number of simple operation checks are presented.

Note:

When the MD0606A is inserted in the MD6401A, refer to the MD6401A main-frame operation manual for the basic operations (cursor movement, and screen changing, etc.).

SD RD ST1 ST2 RT

INTF A	INTER-FACE	TIMING	BIT RATE	DATA LENGTH	PARITY	
SEND	UNIT 1 TTL	ST/SP	9600 b/s	7 bit	EVEN	
RECEIV	UNIT 1 TTL	RT				

INTERFACE

ERROR & DIST	VOLT & FRQ	DELAY TIME	WORD TRACE	TRACE DISPLAY	PRINT OUT

Fig. 4-1 MD0606A TTL INTERFACE Screen

4.1 Setting the Interface Screen Items

4.1.1 TTL Send parameters

				MENU		
1	INTERFACE					
		U 1 TTL	U 2 2.0BPL	U 3 V35	U 4 X20/21	
2	TIMING					
	ST1	ST2	$\overline{ST2}$	ASYNC	ST/SP	
3 M	BIT RATE			*1		
	50 b/s	75 b/s	100 b/s	110 b/s	150 b/s	200 b/s
	255 b/s	300 b/s	400 b/s	500 b/s	510 b/s	600 b/s
	770 b/s	800 b/s	1000 b/s	1200 b/s	1600 b/s	1800 b/s
	2000 b/s	2400 b/s	2500 b/s	3000 b/s	3600 b/s	4800 b/s
	7200 b/s	8000 b/s	9600 b/s	14400 b/s	16000 b/s	19200 b/s
	24 kb/s	32 kb/s	48 kb/s	56 kb/s	64 kb/s	72 kb/s
	96 kb/s	112 kb/s	128 kb/s	144 kb/s	168 kb/s	192 kb/s
	256 kb/s	320 kb/s	384 kb/s	512 kb/s	1024 kb/s	2048 kb/s
	4096 kb/s	8192 kb/s	EXT INPUT			
4	DATA LENGTH			*2		
	5 bit	6 bit	7 bit	8 bit		
5	PARITY			*2		
	NON	ODD	EVEN			
6	STOP BIT			*2		
	1 bit	1.5 bit	2 bit			

M: [MODIFY] key effective

*1: Only when TIMING mode is ST1, ASYNC, or ST/SP

*2: Only when TIMING mode is ST/SP

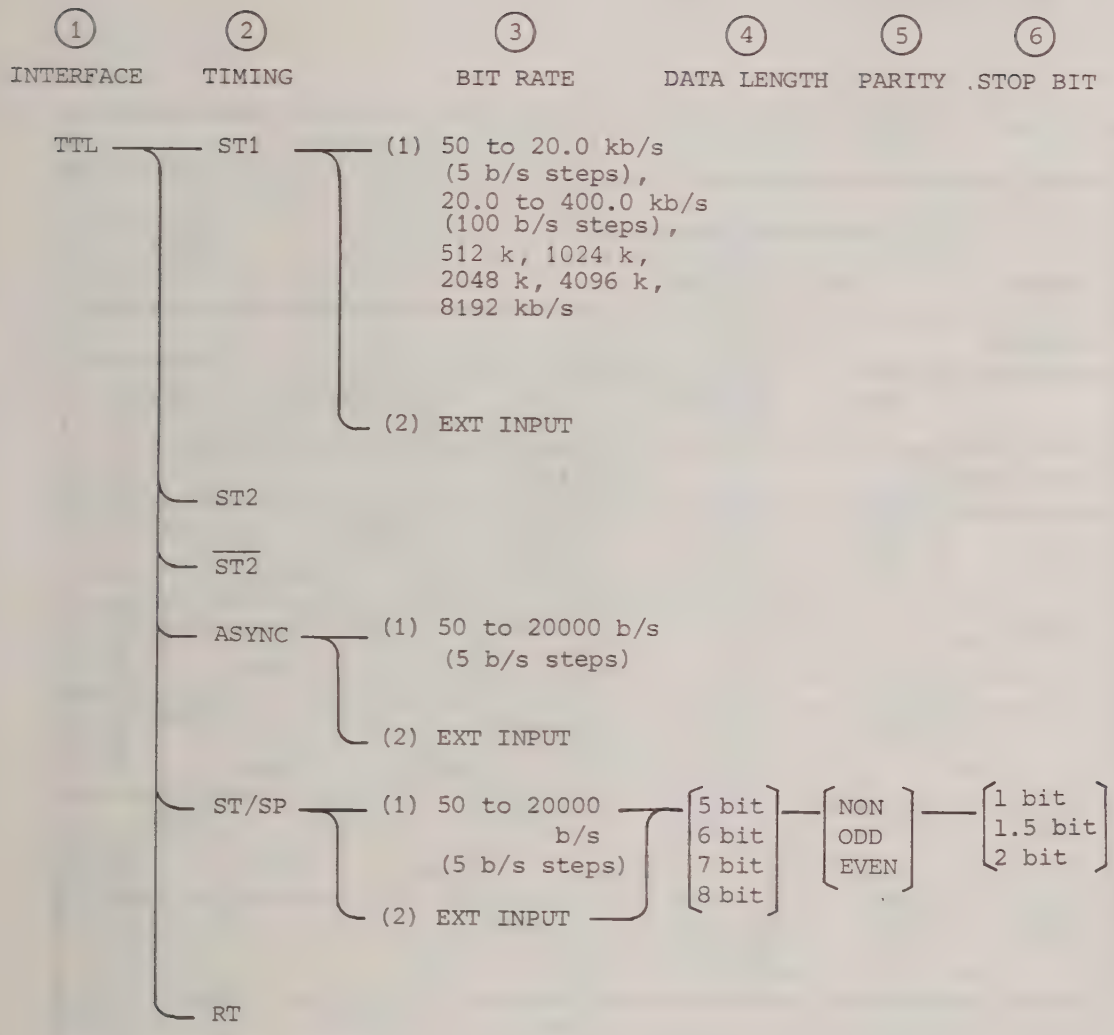


Fig. 4-2 Summary of the MD6401A TTL Send Interface Parameters and Menu Sequence

4.1.2 TTL Receive parameters

				MENU		
1	INTERFACE					
	SAME	U 1 TTL	U 2 2.0BPL	U 3 V35	U 4 X20/21	SELF LOOP
2	TIMING					
		RT	$\overline{RT}$	ST	ASYNC	ST/SP
3	BIT RATE			*1		
	50 b/s	75 b/s	100 b/s	110 b/s	150 b/s	200 b/s
	256 b/s	300 b/s	400 b/s	500 b/s	512 b/s	600 b/s
	768 b/s	800 b/s	1000 b/s	1200 b/s	1600 b/s	1800 b/s
	2000 b/s	2400 b/s	2560 b/s	3000 b/s	3600 b/s	4800 b/s
	7200 b/s	9600 b/s	14400 b/s	19200 b/s		
4	DATA LENGTH			*2		
	5 bit	6 bit	7 bit	8 bit		
5	PARITY			*2		
	NON	ODD	EVEN			

*1: Only when TIMING mode is ASYNC or ST/SP

*2: Only when TIMING mode is ST/SP

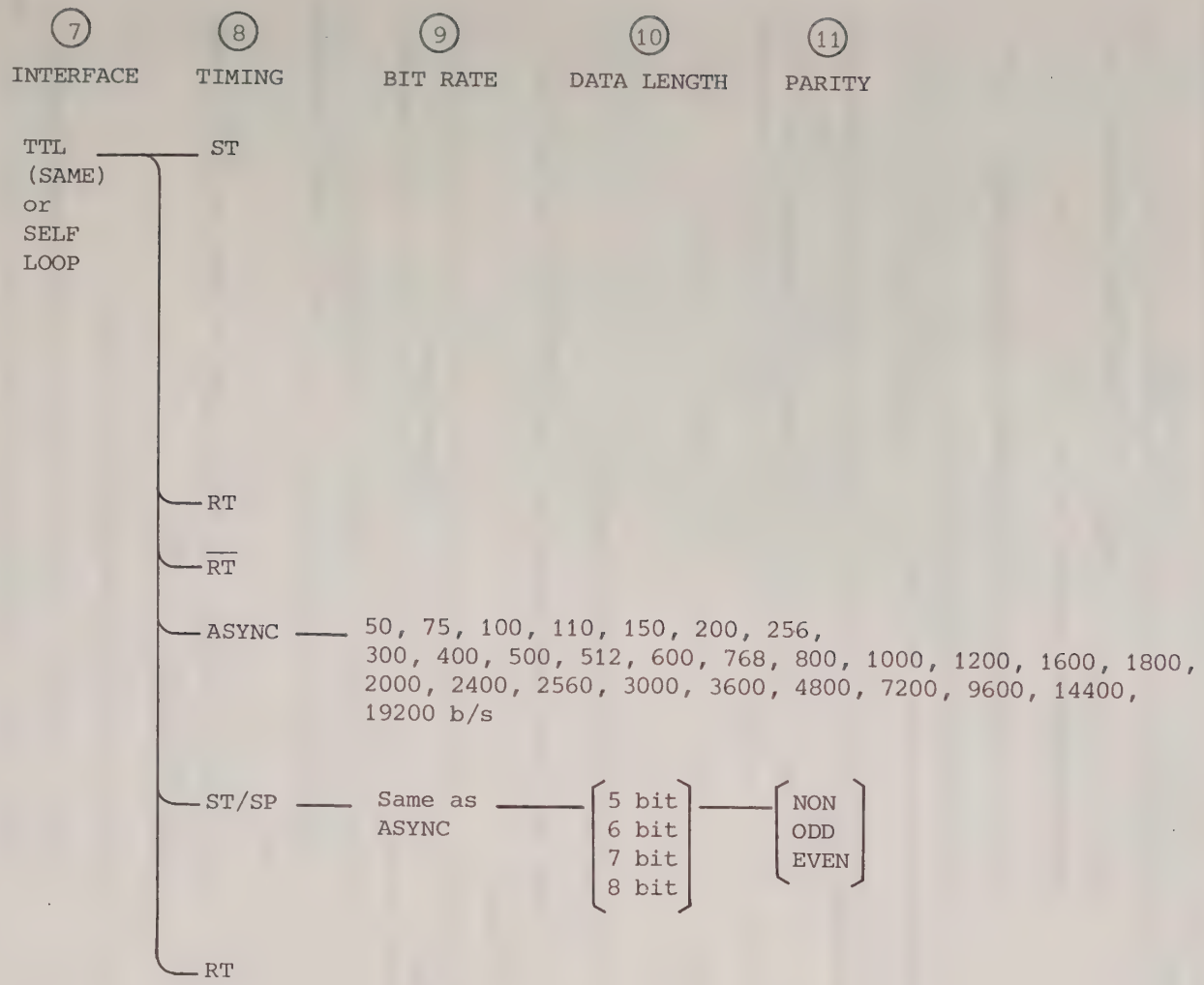
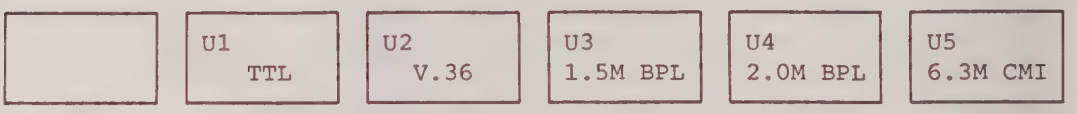


Fig. 4-3 Summary of the MD6401A TTL Receive Interface Parameters and Menu Sequence

4.2 Simple Operation Checks

4.2.1 Confirming that the interface unit is correctly inserted

Step	Procedure
1	Move the cursor to SEND (or RECEIVE) INTERFACE on the INTERFACE screen.
2	Verify that the TTL (MD0606A) is displayed at the appropriate insertion slot.



4.2.2 Confirming error measurements

Use the SELF LOOP mode on the INTERFACE screen as follows:

Step	Procedure
1	Move the cursor to RECEIVE INTERFACE on the INTERFACE screen and press the [SELF LOOP] function key.
2	Set the interface to TTL, SEND TIMING to ST1, and RECEIVE TIMING to RT.
3	Fetch the error-measurement screen.
4	Press the [F1] function key to start measurement. (When CNT is displayed and the error count is 0, the measurement is correct.)
5	Press the [F5] (CH ER INSERT) function key and confirm that one error is added to the error count.

4.2.3 Confirming frequency measurements

Step	Procedure
1	Fetch the SELF LOOP mode from the INTERFACE screen as in paragraph 4.2.2.
2	Fetch the FREQ screen to start measurement.
3	Set the measurement line to ST1.
4	Confirm that the measured value is ST1 as set in the INTERFACE screen.

SECTION 5

EXPLANATION OF MENU ITEMS

The items from the INTERFACE screen menu that were introduced in Section 4 are described in detail below:

5.1 INTERFACE Screen

The measurement interface items for the MD0606A (which has been instead into the MD6401A main frame) may be selected from the INTERFACE screen shown in Fig. 5-1.

The following paragraphs describe the individual items of the INTERFACE screen.

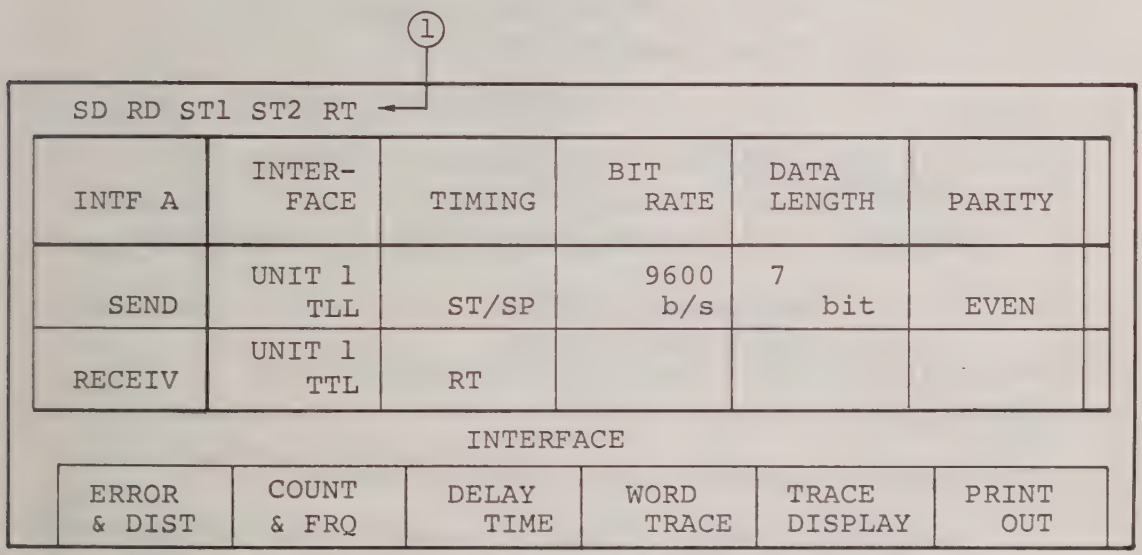


Fig. 5-1 MD0606A TTL Interface Screen

5.1.1 Selection of the signals to be monitored

The signals which will be monitored by the MD0606A are displayed at *1 in Fig. 5-1.

These signal lines are also displayed on all of the other menu screens. (These signal lines may also be monitored externally by means of the check pin terminals located on the rear of the unit. See Fig. 3-1.)

The meaning of each signal line name is as follows:

(1) SD

Transmit (Send) data

Monitors signals sent from the MD0606A.

1: Signal lamp is ON
0: Signal lamp is OFF

(2) RD

Receiver data

Monitors input signals received by the MD0606A.

1: Signal lamp is ON
0: Signal lamp is OFF

(3) ST1

Transmit (Send) signal element timing

The MD0606A sends signal element timing information to device under test (DUT).

ON: Signal lamp is ON
OFF: Signal lamp is OFF

④ ST2

Transmit (Send) signal element timing

The MD0606A receives signal element timing information from DUT.

ON: Signal lamp is ON
OFF: Signal lamp is OFF

⑤ RT

Receive signal element timing

The MD0606A receives signal element timing information from DUT.

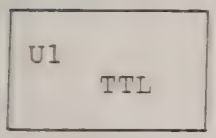
ON: Signal lamp is ON
OFF: Signal lamp is OFF

5.1.2 Send interface parameters

There are 6 send interface setting items as shown in paragraph 4.1.1, which are displayed on the SEND line of the INTERFACE screen (see Fig. 5-1).

(1) Setting the send INTERFACE parameter

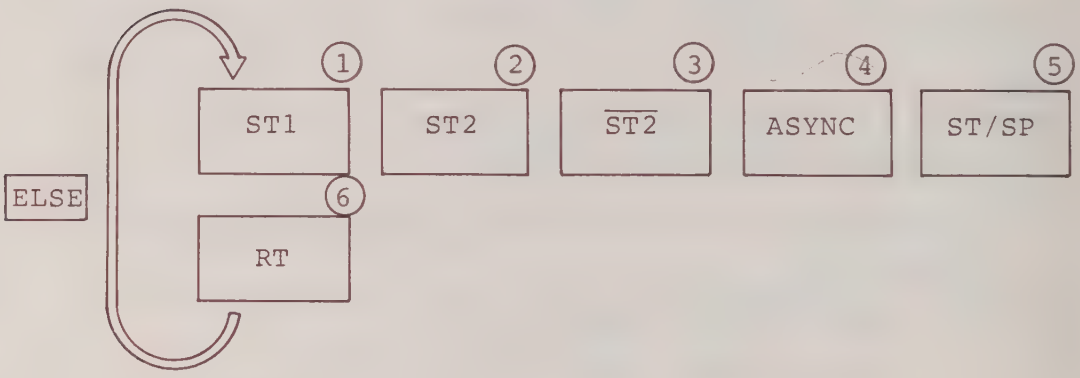
The MD0606A TTL Interface Unit can be selected from the units that are inserted into the MD6401A with the TTL function key.



(2) Setting the TIMING parameter

The following parameters are displayed when the cursor is moved to the TIMING item.

Select the send timing which will be used for measurements.



(1) ST1

Set when using the synchronous mode and when the MD6401A is the master clock source.

(2) ST2

Set when using the synchronous mode
The clock supplied to the ST2 connector by external devices is used as the send timing signal.

(3) $\overline{ST2}$

The inverted ST2-clock is used as the send timing signal.

(4) ASYNC

Set when using the synchronous mode
The MD6401A internal clock is used as the timing clock for both data send and data receive.

⑤ ST/SP

Set when using the ST/SP mode

The MD6401A internal clock is used as the timing clock for both data send and data receive.

⑥ RT

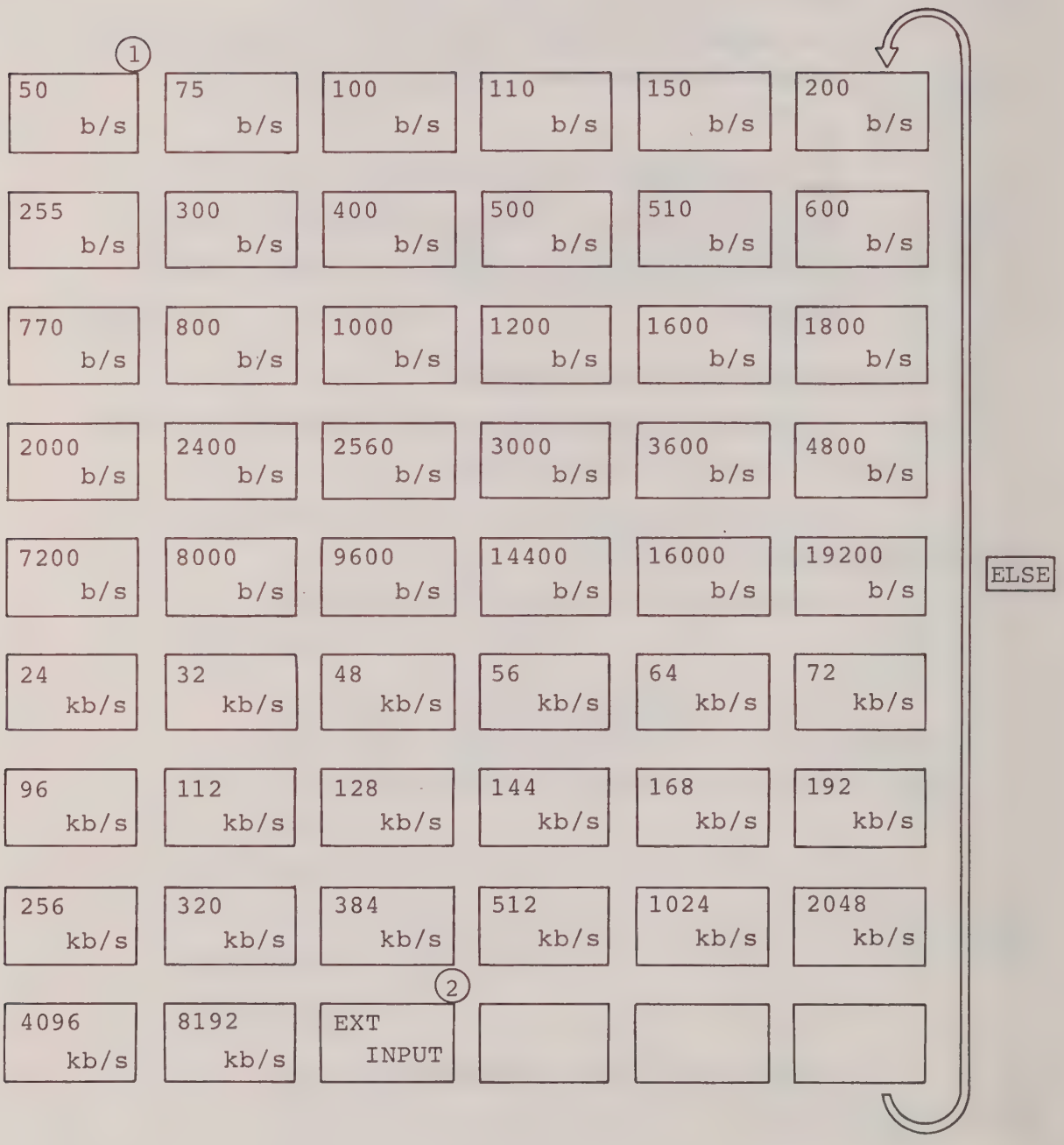
Set when ~~suing~~ using the synchronous mode

The clock supplied to the RT connector by external devices is used as the send timing signal.

(3) Setting the BIT RATE parameter

The following parameters are displayed when the cursor is moved to the BIT RATE item.

Set the bit rate at which measured data is to be transmitted.


1
50 b/s
75 b/s
100 b/s
110 b/s
150 b/s
200 b/s
255 b/s
300 b/s
400 b/s
500 b/s
510 b/s
600 b/s
770 b/s
800 b/s
1000 b/s
1200 b/s
1600 b/s
1800 b/s
2000 b/s
2400 b/s
2560 b/s
3000 b/s
3600 b/s
4800 b/s
7200 b/s
8000 b/s
9600 b/s
14400 b/s
16000 b/s
19200 b/s
ELSE
24 kb/s
32 kb/s
48 kb/s
56 kb/s
64 kb/s
72 kb/s
96 kb/s
112 kb/s
128 kb/s
144 kb/s
168 kb/s
192 kb/s
256 kb/s
320 kb/s
384 kb/s
512 kb/s
1024 kb/s
2048 kb/s
2
4096 kb/s
8192 kb/s
EXT INPUT

① 50 b/s to 8192 kb/s

Set only when TIMING is ST1.

Other values within the displayed range of 50 b/s to 8192 kb/s can be set using the [MODIFY] keys ([⩔], [⩓]).

Values from 50 b/s to 20 kb/s can be set in 5 b/s steps; and values from 20 kb/s to 400 kb/s can be set in 100 b/s steps.

② EXT INPUT

The clock input (TTL or 0 dBm/75 Ω) from EXT1, which is located on the rear of the MD6401A, is used as the send timing signal when EXT INPUT has been selected.

(4) Setting the DATA LENGTH parameter

The following parameters are displayed when the cursor is moved to the DATA LENGTH item after ST/SP has been selected from the TIMING menu.

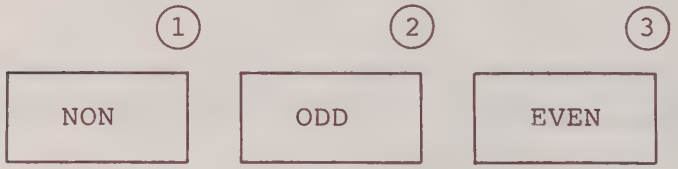
The DATA LENGTH menu sets the start/stop synchronization (ST/SP) data bit length.

5BIT	6BIT	7BIT	8BIT

The programmable-pattern bit length (on the error measurement screen) and the set word length (on the word-pattern generation screen) are also set to this bit length.

(5) Setting the PARITY parameter

The following parameters are displayed when the cursor is moves to the PARITY item after ST/SP has been selected from the TIMING menu.



① NON

No parity

② ODD

Odd parity

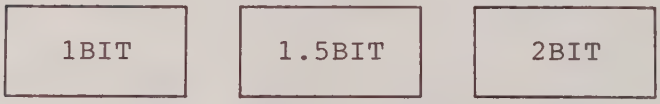
③ EVEN

Even parity

(6) Setting the STOP BIT parameter

The following parameters are displayed when the cursor is moved to the STOP BIT item after the SP/ST has been selected from the TIMING menu.

This is for setting the stop bit length.

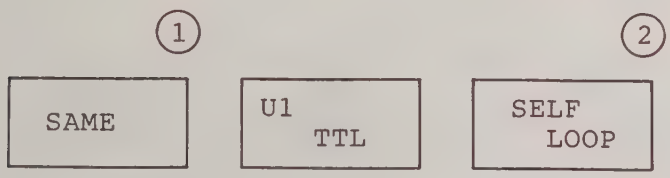


5.1.3 Receive interface parameters

There are five receive interface items which are shown in paragraph 4.1.2 and which are displayed in the RECEIVE line of the INTERFACE screen (see Fig. 5-1).

(1) Setting the INTERFACE parameter

Same as paragraph 5.1.2 (1)



① SAME

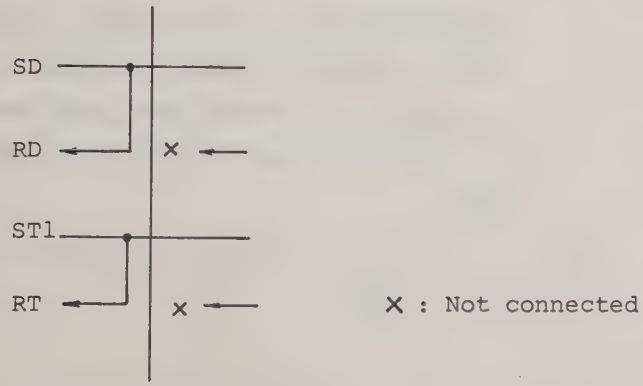
Select this parameter when the receive settings are the same as the settings for the send items.

② SELF-LOOP

Select this parameter when the output data will be fed-back into the input side as input data.

Since output data is used as input data, this parameter is referred to as a SELF-LOOP.

It is used to self-check the data.

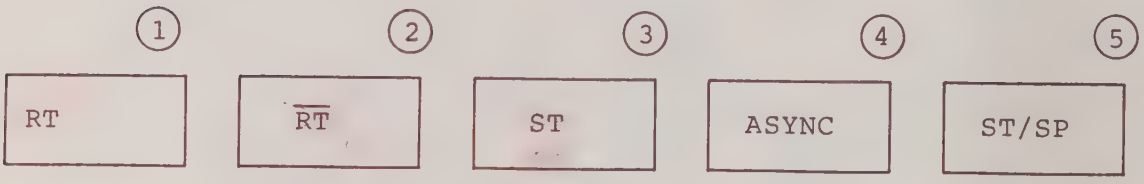


Looped back signals in SELF LOOP mode.

(2) Setting the TIMING parameter

The following parameters are displayed when the cursor is moved to the TIMING item.

Set the receive timing mode which will be used for measurement data transmission.



(1) RT

Set when using the synchronous mode.

The RT-clock supplied by the DCE port is used as the receive timing signal.

(2) $\overline{RT}$

The inverted RT-clock is used as the receive timing signal.

(3) ST

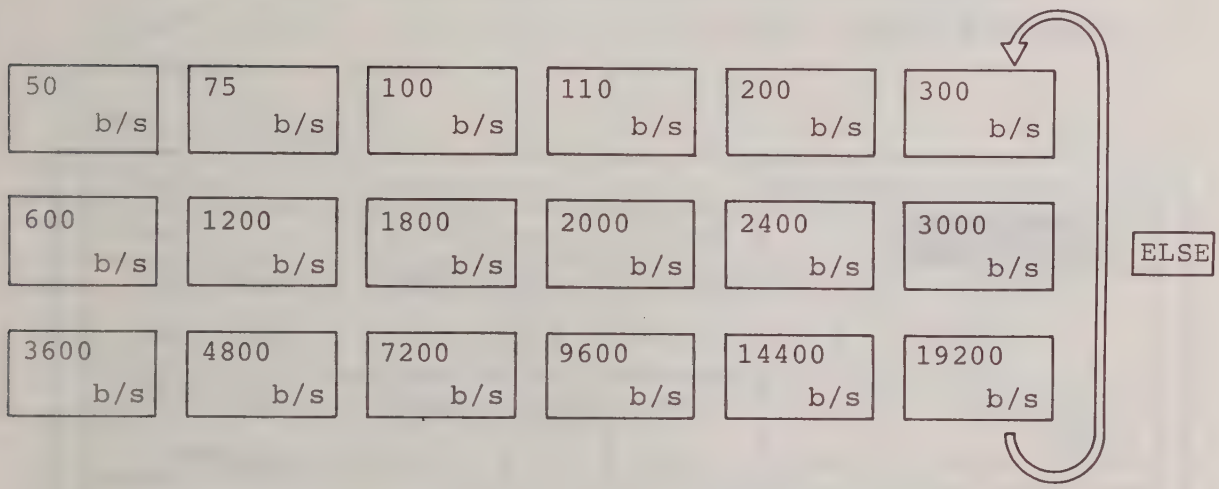
The MD6401A internal clock is used as the receive timing signal.

Since the ST clock signal is the same clock signal that is used for send timing, if ST1 has not been selected from the send timing menu, then ST cannot be selected from the receive timing menu.

(4) and (5) are the same as those in paragraph 5.1.2 (2).

(3) Setting the BIT RATE parameter

The following parameters are displayed only when the cursor is moved to the BIT RATE item and the receive TIMING mode is either ASYNC or ST/SP.



(4) Setting the DATA LENGTH parameter

See paragraph 5.1.2 (4).

(5) Setting the PARITY parameter

See paragraph 5.1.2 (5).

5.2 ERROR Screen

The error measurement screen (shown below) is displayed when the ERROR item is selected from the INTERFACE menu.

Individual items of the MD0606A ERROR screen are explained below:

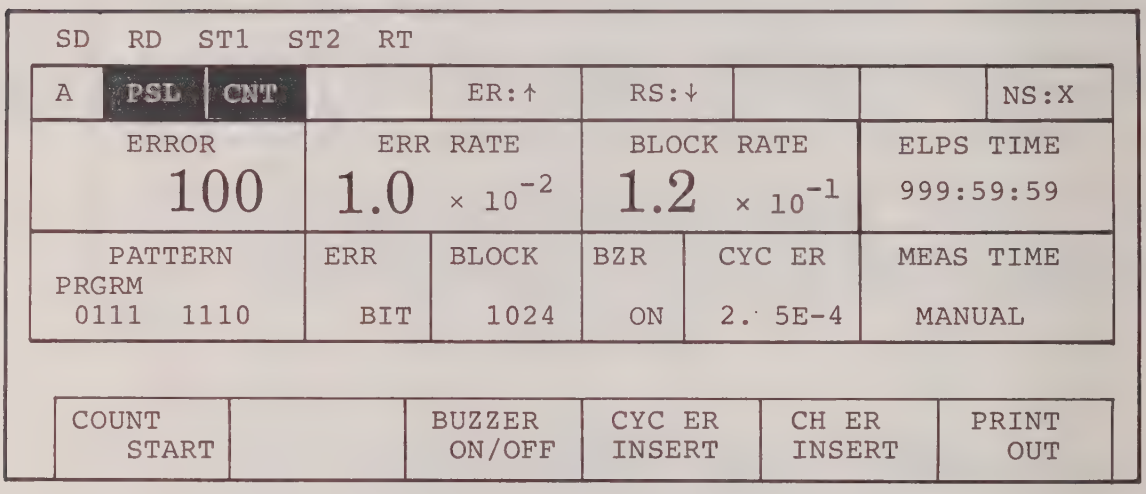
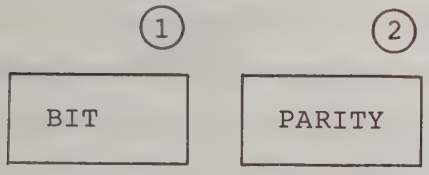


Fig. 5-2 ERROR Screen

5.2.1 Setting the ERROR measurement item

The following parameters are displayed when the [ERR BIT] menu item is selected from the ERROR screen.

Either the BIT (error) or PARITY (error) may be selected; but when such measurements are performed, the MD0606A must be operated in ST/SP mode and with either an ODD or EVEN parity.



(1) BIT

Bit error measurement

(2) PARITY

Parity error measurement

Note:

If pattern sync. loss occurs, [PSL] message will appear on the display.

In general, this [PSL] message is displayed only for bit error measurements.

The other settings are used in common for all MD06xxx units. Refer to the MD6401A operational manual.

5.3 COUNT/FREQUENCY Screen

The COUNT/FREQUENCY measurement screen is displayed when the COUNT/FRQ item is selected from the INTERFACE menu. Individual items of the MD0606A COUNT/FREQUENCY menu are described below:

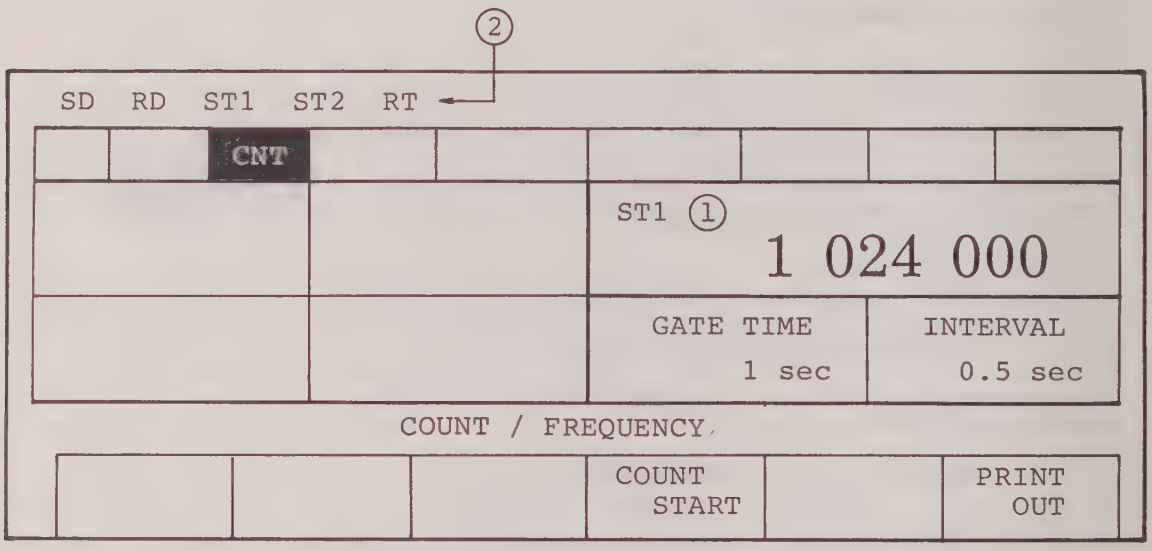


Fig. 5-3 COUNT/FREQUENCY Screen

5.3.1 Selecting the frequency/count measurement line

The frequency/count line to be measured is specified at cursor position ① of Fig. 5-3.

The line to be monitored is specified at cursor position ② of Fig. 5-3.

Refer to paragraph 5.1.1 for a description of each signal line.

5.4 DELAY TIME Screen

Individual items of the MD0606A DELAY TIME measurement screen can be selected from the INTERFACE menu and are described below:

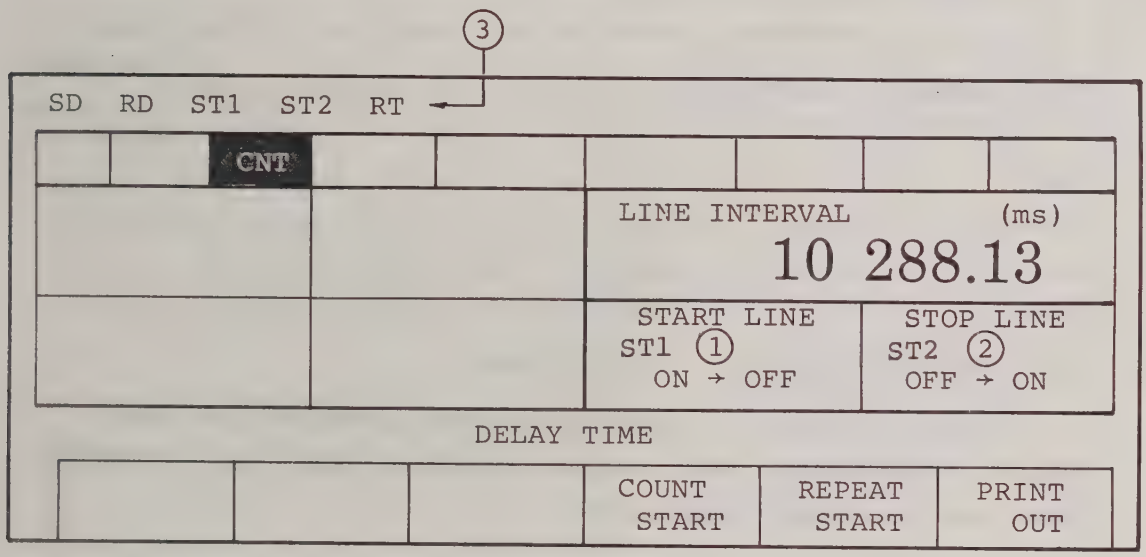


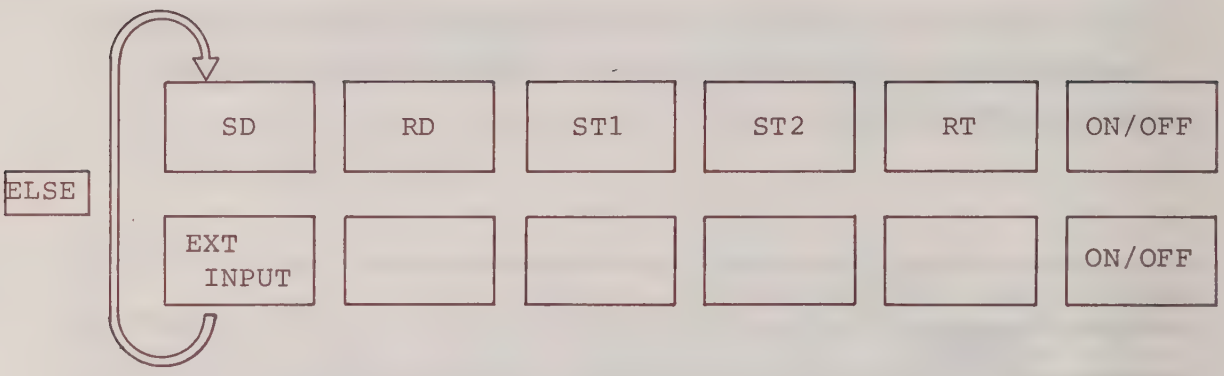
Fig. 5-4 DELAY TIME Screen

5.4.1 Selecting the START/STOP LINE

The START and STOP LINEs which will initiate and terminate data measurements, respectively, are specified at cursor position ① and ② of Fig. 5-4.

The line to be monitored is specified at cursor position ③ of Fig. 5-4.

See paragraph 5.1.1 for a description of each signal line.



5.5 WORD GENERATE/PATTERN TRACE Screen

The individual items of the WORD GENERATE/PATTERN TRACE (WORD/TRACE) menu can be selected from the INTERFACE menu and are described below:

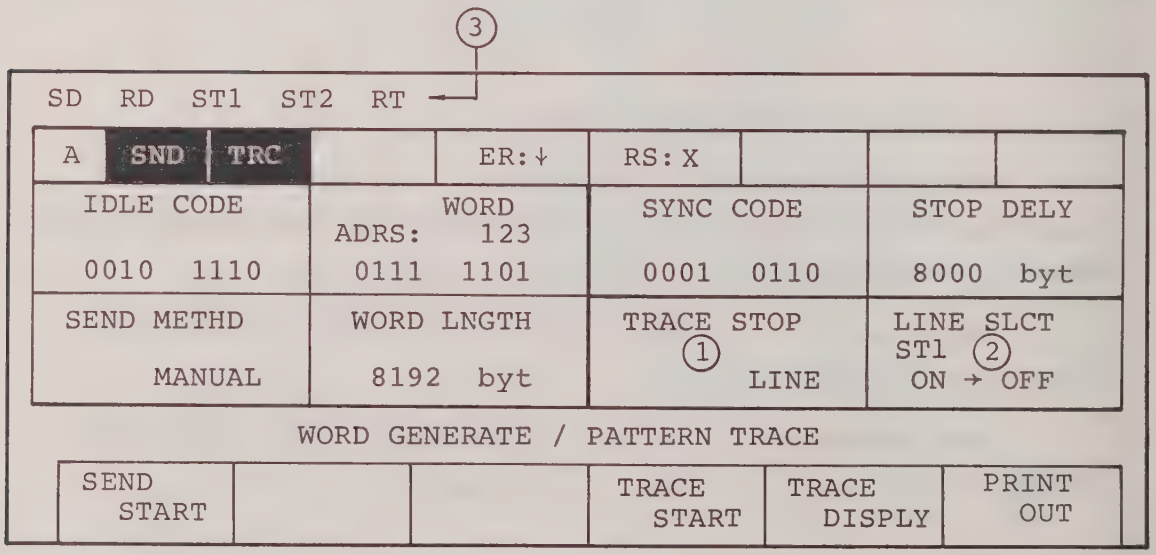


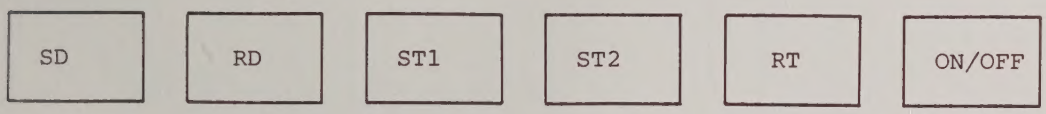
Fig. 5-5 WORD/TRACE Screen

5.5.1 Setting the LINE SLCT

After the LINE has been selected at TRACE STOP (1), the line-change trigger condition for stopping the signal trace can be specified at LINE SLCT (2).

The line to be monitored is specified at cursor position (3) of Fig. 5-5.

See paragraph 5.1.1 for a description of each signal line.



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